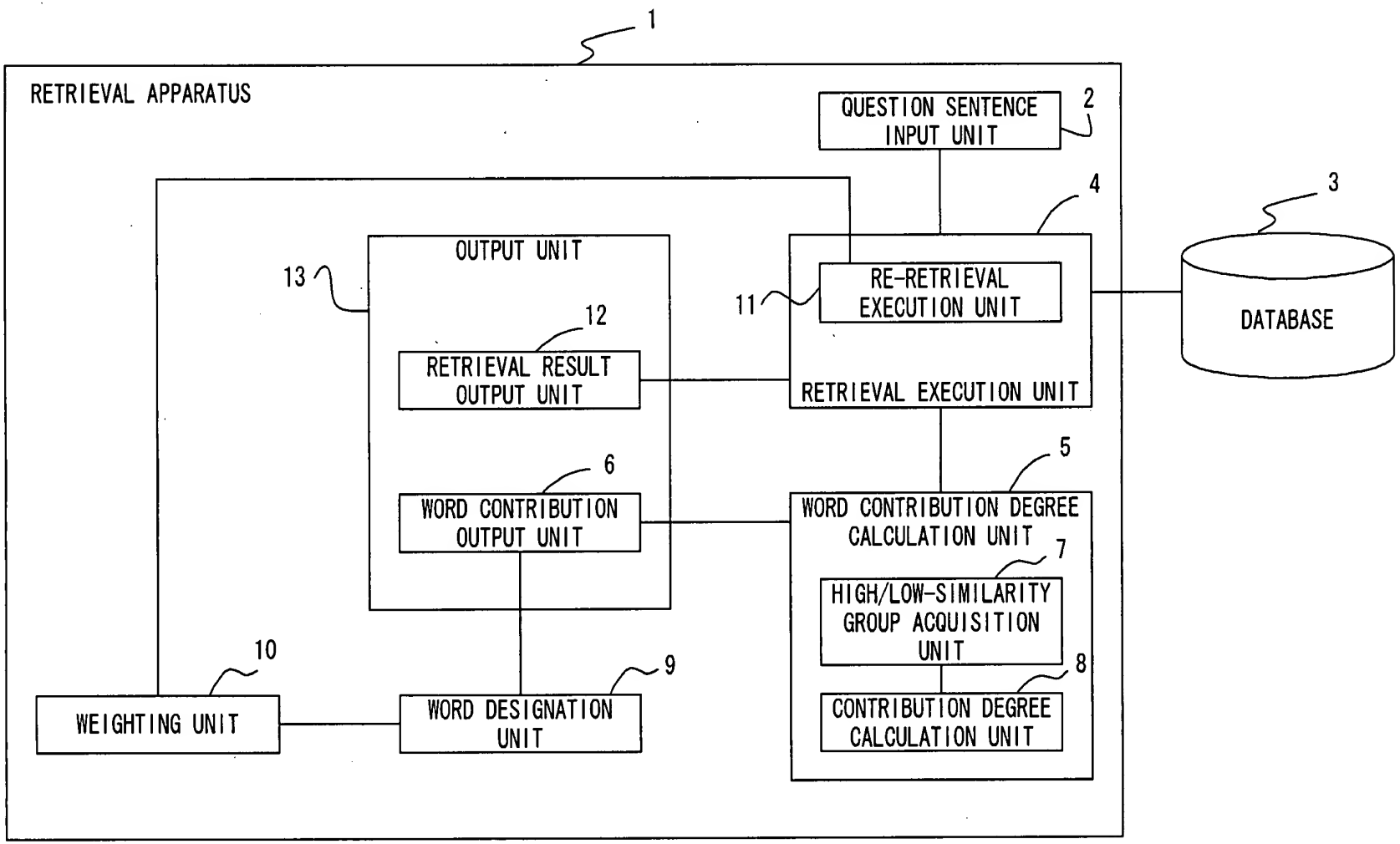


FIG. 1

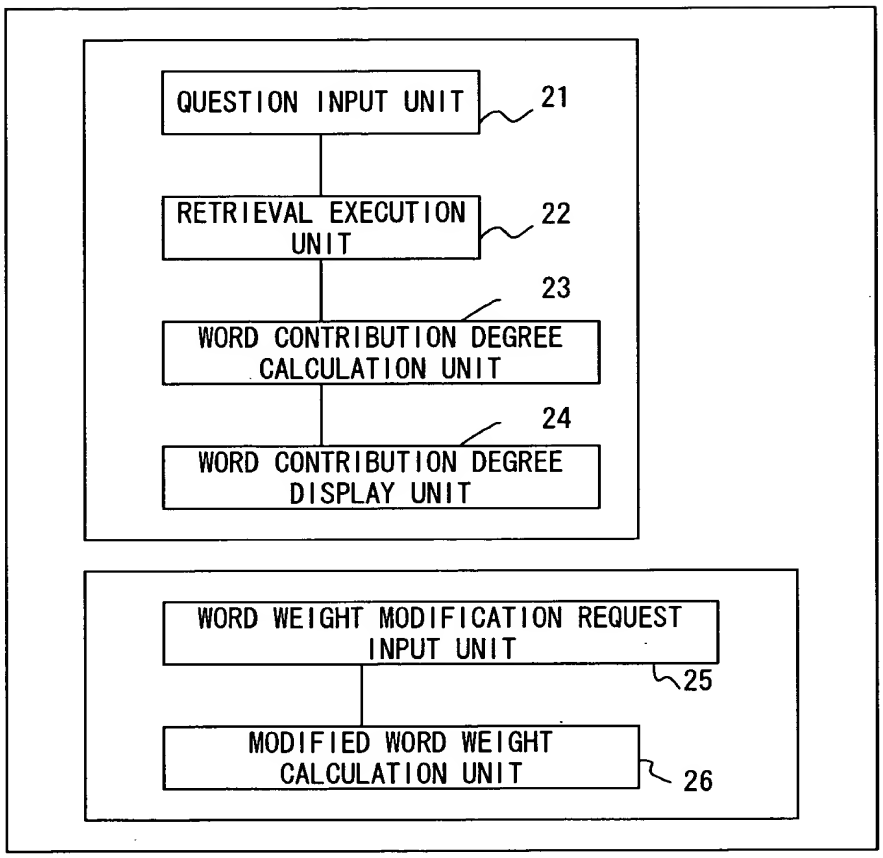


FIG. 2

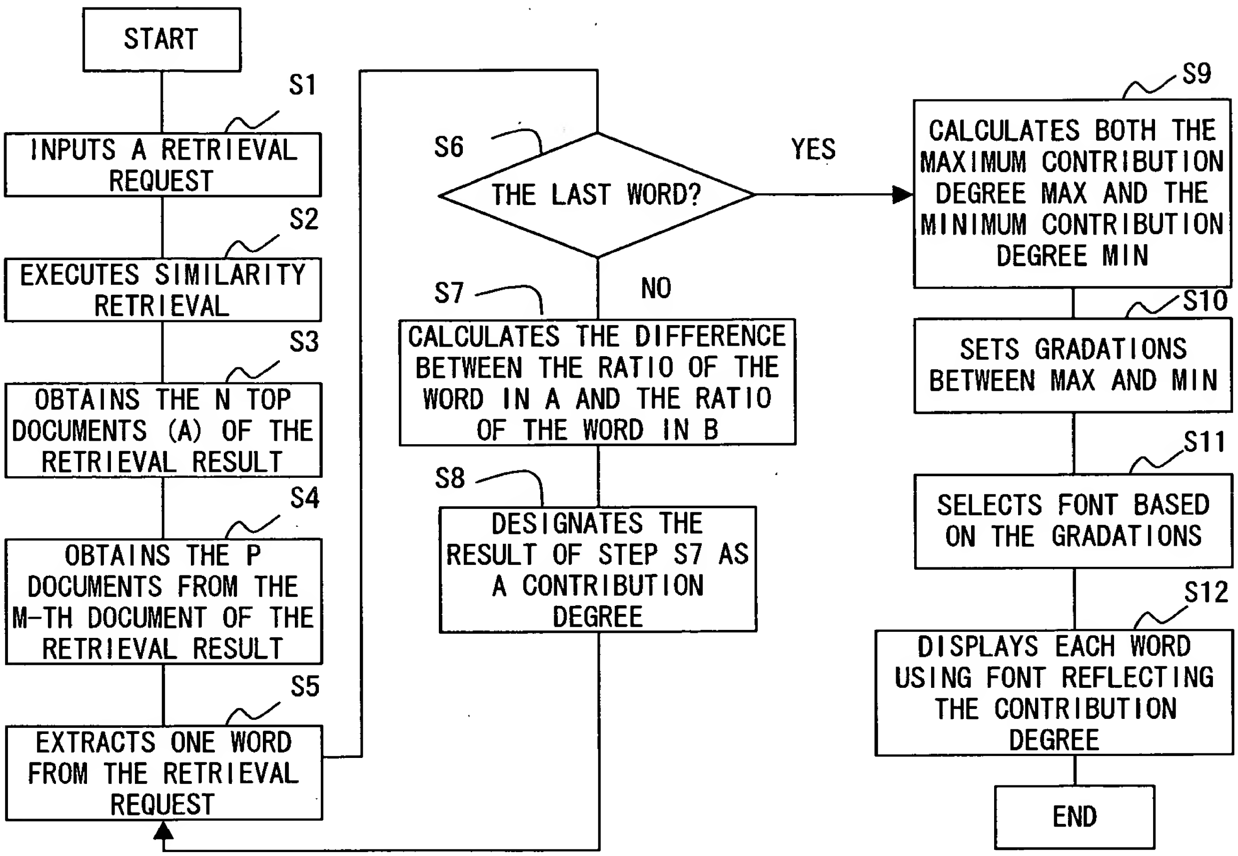

START
S1
INPUTS A RETRIEVAL REQUEST
S2
EXECUTES SIMILARITY RETRIEVAL
S3
OBTAINS THE N TOP DOCUMENTS (A) OF THE RETRIEVAL RESULT
S4
OBTAINS THE P DOCUMENTS FROM THE M-TH DOCUMENT OF THE RETRIEVAL RESULT
S5
EXTRACTS ONE WORD FROM THE RETRIEVAL REQUEST
S6
THE LAST WORD?
YES
NO
S7
CALCULATES THE DIFFERENCE BETWEEN THE RATIO OF THE WORD IN A AND THE RATIO OF THE WORD IN B
S8
DESIGNATES THE RESULT OF STEP S7 AS A CONTRIBUTION DEGREE
S9
CALCULATES BOTH THE MAXIMUM CONTRIBUTION DEGREE MAX AND THE MINIMUM CONTRIBUTION DEGREE MIN
S10
SETS GRADATIONS BETWEEN MAX AND MIN
S11
SELECTS FONT BASED ON THE GRADATIONS
S12
DISPLAYS EACH WORD USING FONT REFLECTING THE CONTRIBUTION DEGREE
END

FIG. 3

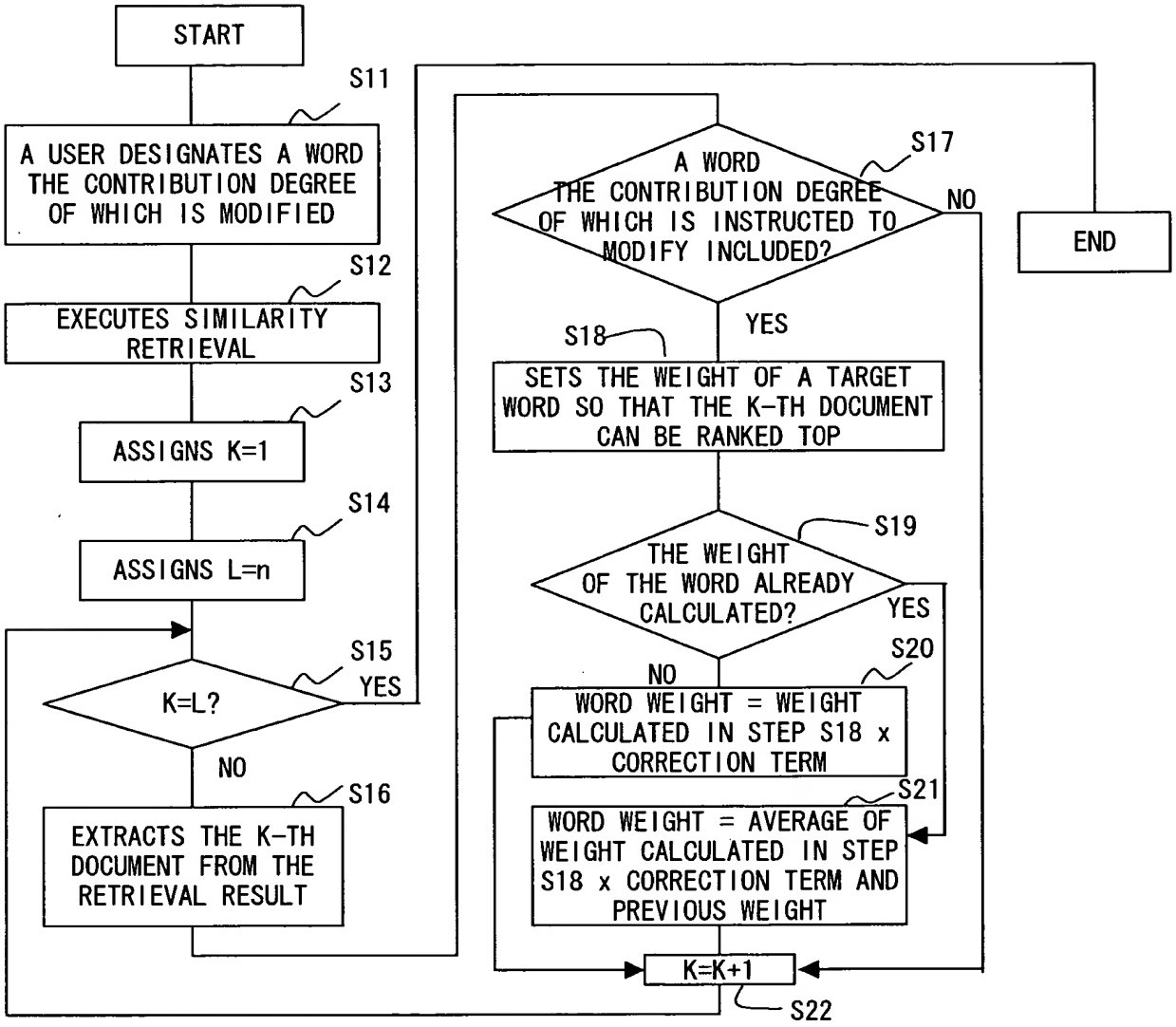
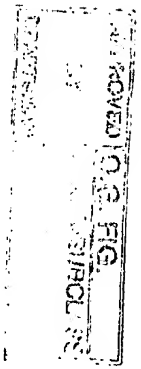


FIG. 4

- PURPOSE
  - SEARCHES FOR A WORD hybrid car
- QUESTION SENTENCE
  - INPUTS IN A NATURAL LANGUAGE(REQUEST FORMAT TO A SEARCHER)
  - TAKE TREC Query NO. 385 AS AN EXAMPLE
  - Identify documents that discuss the current status of hybrid automobile engines, (i.e., cars fueled by something other than gasoline only.) A relevant document may include research on non-gasoline powered engines or prototypes that may be fueled by natural gas, methanol, alcohol; cost to the consumer, health benefits derived; and shortcomings in horsepower and passenger comfort.

FIG. 5



- A = TOP 10 DOCUMENTS
- B = 200 DOCUMENTS FROM THE TOP 800 DOCUMENTS
- CALCULATION EXPRESSION
- CONTRIBUTION DEGREE CALCULATION EXPRESSION(Term Selection Value(Bougham formula))

Tsv = (r/R - alpha* s/S) * w
alpha = parameter
w = r/(R-r)/ (n-r)/(N-n-R+r)
r = NUMBER OF DOCUMENTS, INCLUDING A TARGET WORD, OF A
R = A
n = NUMBER OF DOCUMENTS, INCLUDING A TARGET WORD
S = B
s = NUMBER OF DOCUMENTS, INCLUDING A TARGET WORD, OF B
N = NUMBER OF ALL DOCUMENTS

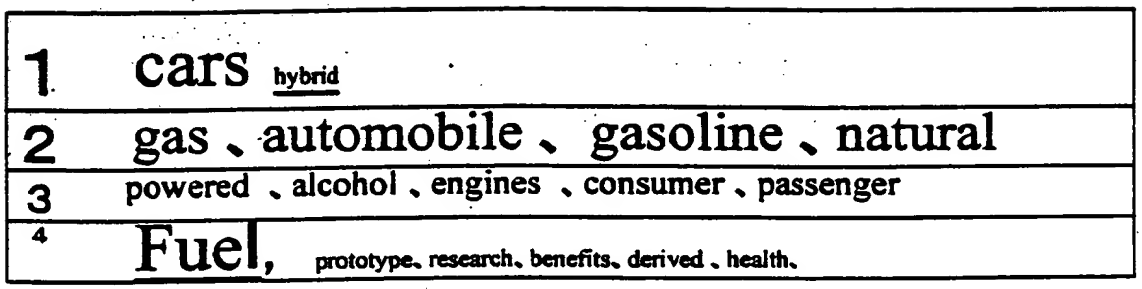
FIG. 6

- fuel 7.2
- methanol 6.8
- cars 6.1
- gas 5.4
- automobile 5.1
- gasoline 4.8
- natural 4.5
- powered 3.7
- alcohol 2.4
- engines 2.2
- consumer 2.1
- passenger 2.0
- prototypes 1.6
- research 1.0
- benefits 1.0
- derived 0.9
- health 0.7
- hybrid 0.6

FIG. 7

1	Fuel、methanol 、cars
2	gas 、automobile 、 gasoline 、natural
3	powered 、alcohol 、engines 、consumer 、passenger
4	prototype、research、benefits、derived 、health、hybrid

FIG. 8



MAXIMIZES THE CONTRIBUTION DEGREE OF A WORD hybrid

DROPS THE CONTRIBUTION DEGREE OF A WORD fuel

DELETES A WORD methanal

FIG. 9

	Cars	hybrid	gas	automobile	gasoline	natural	powered	alcohol	fuel
1	5	0	1	1	3	1	2	1	5
2	4	0	1	0	3	1	2	1	5
3	3	0	0	0	2	1	1	0	3
:									
8	2	1	2	1	1	0	2	1	1
9									
10									
:									
:									
20									
:									
:									
:									
1000									

FIG. 10

	Cars	hybrid	gas	automobile	gasoline	natural	powered	alcohol	fuel
1	5	0	1	1	3	1	2	1	5
2	4	0	1	1	3	1	2	1	5
3	3	0	0	0	2	1	1	0	3
.									
.									
8	2	1	2	1	1	0	2	1	1
9									

- CALCULATION FOR RANKING UP A DOCUMENT, INCLUDING A WORD Hybrid
  - THE SCORES OF THE TOP AND EIGHTH DOCUMENTS ARE 19 AND 11, RESPECTIVELY
  - TO RANK UP THE EIGHTH DOCUMENT TO THE TOP, MULTIPLY THE WORD Hybrid BY 9
  - WEIGHT OF THE WORD Hybrid 3 = 9 x 1/log(8)

- CALCULATION FOR RANKING DOWN A DOCUMENT, INCLUDING A WORD fuel
  - THE SCORES OF THE TOP AND EIGHTH DOCUMENTS ARE 19 AND 11, RESPECTIVELY
  - TO BRING THE TOP DOCUMENT CLOSE TO THE EIGHT, SET THE WORD fuel TO 1(THE MINIMUM)
  - WEIGHT OF THE WORD fuel 1/5 = 1/5 x 1/log (1)

FIG. 11

hybrid	5.3
cars	5.1
gas	4.8
automobile	4.6
gasoline	4.2
natural	4.1
fuel	4.1
powered	3.7
prototypes	3.4
alcohol	2.1
engines	1.3
consumer	1.1
passenger	1.0
research	0.9
benefits	0.5
derived	0.3
health	0.2

FIG. 12

• 1 hybrid ,cars ,gas , automobile
• 2 gasoline ,natural ,fuel ,powered,prototypes
• 3 alcohol engines consumer passenger
• 4 research , benefits, derived, health

FIG. 13

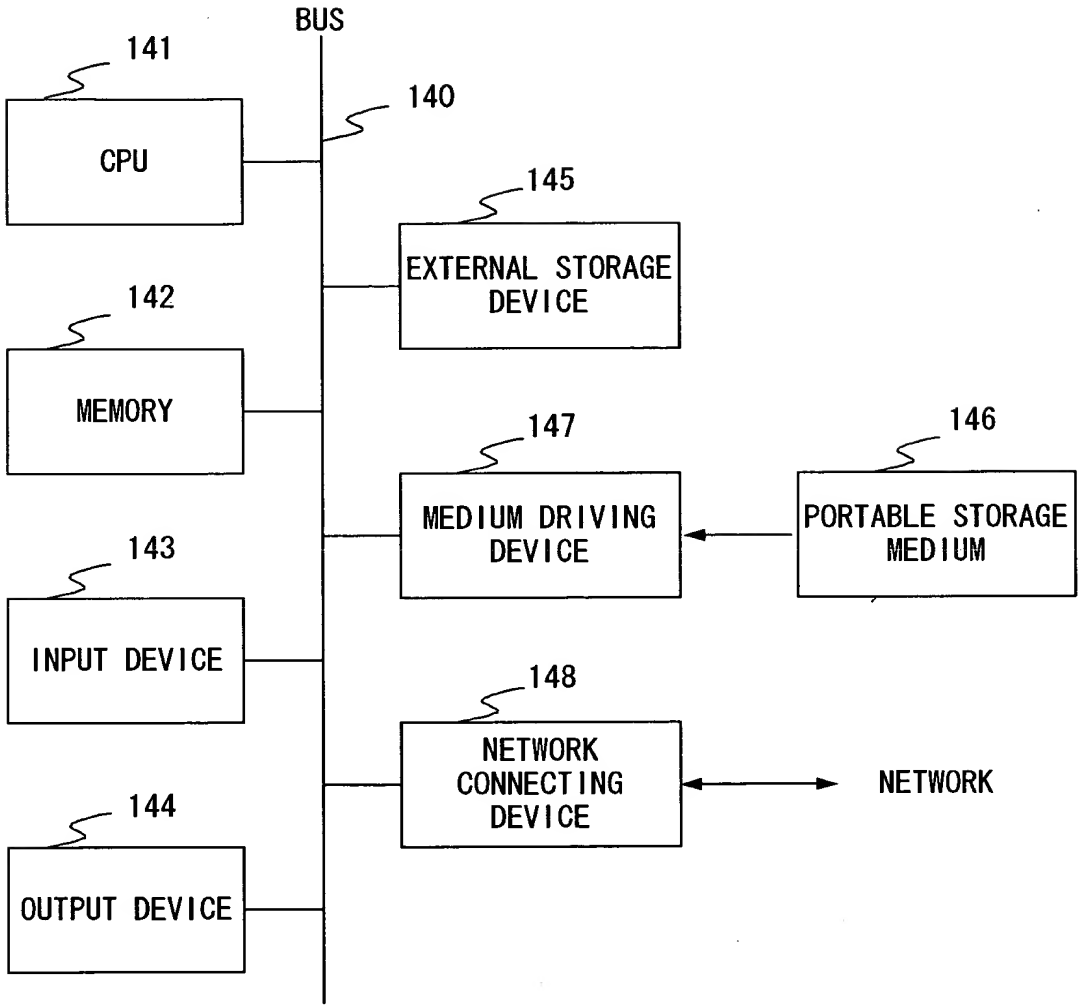


FIG. 14

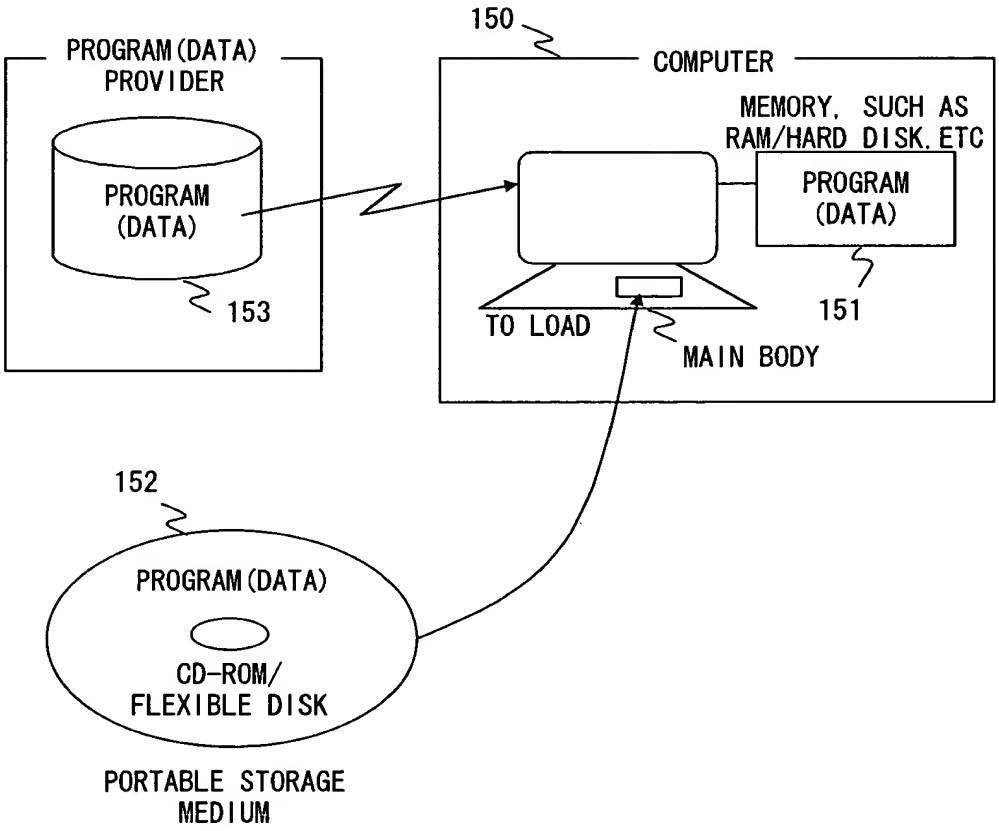


FIG. 15